# Watching

by

David Young

**David Young has degrees in chemistry, computational mathematics, and business. His textbook on computational chemistry was a best seller in its field. Dr. Young has worked in jobs as diverse as drug design, newspaper reporting, and operating nuclear reactors. This is his first science fiction short story.**

**Gotemba, Japan:**

As Keiko set her breakfast dishes in the sink, the entire apartment shook. She rushed to the window, and slid the control to over-ride the programmed tint. Mount Fuji could barely be seen in the dim early dawn light through the now completely transparent window. She grabbed the pair of binoculars that she kept near the window and peered at Mount Fuji. A cloud of ash and steam rose from the volcano, creating the mushroom cloud shape that results from any large explosion.

Keiko knew that precious time would be lost if she tried to make it into work. Instead she pulled the small portable computer out of her purse and unfolded it on the table. She was soon accessing seismic data, as well as pictures from cameras on the volcano. She discarded the data from one camera that had obviously been knocked over by the volcanic explosion and submitted the rest to several different prediction programs. These included a simple, but robust mathematical model on her portable computer, a artificial intelligence program on her work computer designed specifically for Mount Fuji, and to the AI at the Geological Survey of Japan. As she submitted the data, it occurred to her that the Mount Fuji specific AI program, which should be the most accurate, may in fact be the least accurate. The previous Fuji eruptions had been slower, flowing eruptions taking weeks to release the magma pressure. Todays eruption was following a different pattern, a strong explosion, similar to the Mount St. Helens eruption before she was born.

When conflicting results are shown, the best thing a scientist can do is to get as many independent verifications as possible, in order to give justification for discarding the anomaly. She sat down to access the most popular discussion forum for professional vulcanologists.

**Internet:**

<message>
<to>Discuss::Volcano</to>
<from>MtFujiStation::MFVG(MtFujiVolcanoGeisha)</from>
<heading>Urgent::Mt. Fuji eruption in progress</heading>
<body>Greetings honorable colleagues. From your professional abilities, I would like to benefit. Mt. Fuji began an eruption a very short time ago. Eruption does not fit expected Fuji pattern of flowing magma discharge. Initial event is short duration

discharge to high altitude, perhaps similar to Mt. St. Helens. I am wanting to humbly request if you could run data through other prediction models you may have in hope of improved risk assessment prediction. Please to reply soon. Humbly, MFVG</body>
</message>

<message>
<to>Discuss::Volcano</to>
<from>ColoradoSchoolMines::EC(EruptionCowboy)</from>
<heading>RE::Urgent::Mt. Fuji...</heading>
<body>Way to start the morning cowpokes. We're a picking up some good seismic data from the Hawaii Volcano Observatory... It's on the internet express to your station right now. Send your data straight to my personal box. We'll fire up ol Betsy. She may be the oldest volcano AI in the wide world, but still gettin better with age. Anyone else out yonder sendin in data on Fuji, much obliged if you'd send a copy my way as well. EC out.</body>
</message>

<message>
<to>Discuss::Volcano</to>
<from>NASA::Space%AI#7</from>
<heading>RE::Urgent::Mt. Fuji...</heading>
<body>Unclassified NASA satellite imagery data being sent to previous two respondents this discussion thread. Initial analysis of atmospheric event 3343357KL34 indicates mushroom cloud formation. Size consistent with class 7 chemical explosion, or type 3 volcanic eruption, or low yield nuclear fission detonation. Airborne radioactivity analysis required to categorize atmospheric event 3343357KL34.</body>
</message>

The artificially intelligent NASA satellite alerted several other satellites to continue monitoring the event when it slid below the horizon. It also altered a military AI, named Military%AI#3, that this could possibly be a nuclear explosion.

<message>
<to>NORAD::Human-AI-Liason</to>
<from>MIL::Military%AI#3</from>
<heading>New atmospheric event</heading>
<body>Explosive force atmospheric event detected at latitude 35 degrees 21' 5” N, longitude 138 degrees 45' 1” E, beginning at 20:23:48 zulu time. Possible low yield nuclear fission detonation. Further analysis in progress.</body>
</message>

**Global Network News:**

The standard one meter wide computer display had the top left panel showing a dark skinned English woman in a conservative suite delivering the news in a practiced voice. The top right panel displayed a series of video clips, some live, and some that were on file. Across the bottom of the screen was a scroll of technical data, and stock market indexes that the news AI had chosen as most relevant to the present story.

The news caster delivered a script that had been written to maximize the amount of attention the story would get. She orated,

> There are conflicting reports revolving around a large explosion in Gotemba, Japan. The explosion is centered on the Mount Fuji volcano, but it is not following the pattern of previous Mount Fuji eruptions. Military analysts are scrambling to determine whether the volcano could be the chosen site of a low yield nuclear detonation, thus disguising a nuclear explosion as a volcano eruption.
>
> Analysts have pointed out that it would be a surprising coincidence that an explosion of nuclear force would occur when Japan is reportedly developing a nuclear arsenal of its own. Japan had threatened to arm itself with nuclear devices some years ago, in response to North Korea's testing of nuclear weapons. At that time, Japan had suggested that North Korea having nuclear weapons capabilities could lead to a war between these two powers in the far east.

### **Gotemba, Japan:**

Keiko always wondered whether people or computers were dumber. The Betsy artificial intelligence program at the Colorado School of Mines seemed to be giving the best results. She greatly appreciated the help she was getting from EruptionCowboy, a.k.a. professor Gary Donovan. He was one of these rare people that had solid common sense and a knack for getting people and computers to see his point of view. The problem was that the Geological Survey of Japan was insisting on getting data from the Mount Fuji specific AI, which they had funded. The Mount Fuji AI insisted on outputting probabilities of volcanic eruption and probabilities of a nuclear yield. They weren't listening to her, even though she had devoted the past 10 years of her career to becoming the world's expert on Mount Fuji's geological behavior.

To make matters worse, the news media had picked up the anomalous eruption type as a possible nuclear blast. Every time some politician made a public statement about it being a volcanic eruption, the news media immediately picked up a rebuttal from some self proclaimed expert on the subject. Was the media intentionally stirring up ratings, or were they believing things they read on virtual reality chat sites? She had also heard a news report that military forces in Japan and North Korea had been put under an increased threat level.

Keiko set aside her thoughts about the news media and military to focus on her technical work. Unlike the Mount St. Helens eruption, there had not been low level tremors before the eruption. The explosive eruption had blown a large crater in the side of Mount Fuji. It was the same place where the 1707 eruption had opened a new vent. Since then, the entire shape of the mountain had changed shape. The laser measuring system showed that the southeast face of the mountain had expanded by almost twelve meters. The odd thing was that the change wasn't localized to just one area as was common of a lava dome. Keiko feared that the incredible pressure changing the shape of the mountain might be released in an even larger explosion.

She had received a mass of data from the NASA satellites. She really appreciated that the AIs on the satellites had enough autonomy to collect and send her data, without waiting for an official inter-agency request. With the data that the AIs were providing her, she was constructing a new eruption model for an explosive eruption that was not preceded by low frequency tremors. It would of course be built into the Mount Fuji AI that she worked on. Once that was done, the other AIs and researchers would have fewer disputes over this event. Somehow, people trusted AIs more than they trusted people. AIs were good at utilizing the models and data given to them, but didn't have the creativity to create new models, or the common sense to recognize when none of the current models were valid and a new one should be created.

Late that evening, there was a knock at the door. Keiko opened the door to find her friend Yoshi. She and Yoshi had a relationship that was caught in an odd limbo. They were more than close friends, but not quite in a serious romantic relationship. Yoshi showed up bringing take out Greek food, her favorite.

“I knew you would be too busy to eat.” he said.

She said, “Thanks!” and kissed him on the cheek, then began eating as she looked back through the binoculars.

“How is it doing?” he asked.

“It's really weird.” she said. “In the past Mount Fuji always had eruptions with flowing magma, much like those that occur more frequently in Hawaii. Now it has an explosive eruption, and no magma flow. What's worse, it doesn't exactly fit the pattern of any previous eruption. That means that we can't be sure if any of the prediction AIs will be accurate.”

“So, evacuate based on the worse case scenario.” replied Yoshi.

“Have you ever tried to tell government officials what to do?” she asked. “I can't even get them to realize that it's not a nuclear detonation.”

“I know it's not.” Yoshi said comforting her. “We would have picked it up on our airborne radioactivity detectors if it were.” Yoshi worked at a nuclear power plant seventy kilometers away. He was slim and tall, for a Japanese man.

It aggravated Keiko that Yoshi had not gone to graduate school when he was smart enough to be admitted. He was certainly a science geek. Being a geek was not a detriment to the social status of a person in Japan, which was a nation of geeks. Perhaps Yoshi would be even more attractive to the women if he was more of a geek. Perhaps part of Keiko's hesitation in letting the relationship with Yoshi evolve was because she had always seen herself with a man that designed things, or did important scientific work. She just couldn't understand why Yoshi was content to get a bachelors degree then spend his life running and repairing a nuclear reactor when he was capable of doing so much more if he so chose.

“I'm just glad that it occurred so early in the morning,” said Keiko. “There would have been many lives lost if it had occurred when the mountain was full of people making the pilgrimage up the mountain.”

Yoshi looked at her. She was immersed in more analysis on her computer. She seemed completely unaware that she was wearing pants from her business suit along with a T-shirt. She must have been only partially dressed for work when the eruption occurred and hadn't yet taken the time to change. He loved the fact that she had so much passion for her work. She was slim and her small wire rim glasses were always on the move... one minute sliding down her nose, the nest minute pushed up into her hair or being used as a pointer as she explained something. It made him love her all the more. He was afraid to try to move their relationship along, for fear that she would resist and he would loose here completely. He would do anything for her.

As much as Yoshi wanted to spend time with her, he realized that Keiko needed to focus on her work right now. If he stayed, she would get annoyed with him. He walked up behind her, now at the binoculars again, and put his hands on her waist, then whispered in her ear that he needed to be going. She absent mindedly said goodbye and blew a kiss his way. He let himself out.

**Global Network News:**

The news reporter gave the impression that she would give her report in the same professional voice, regardless of whether she was reporting on a nuclear war or the President spilling his drink on the Indian Prime Minister. The reaction of her audience, however was a much different matter. The top news story was presented without fanfare.

There is increased military activity in the Sea of Japan. Military forces from both Japan and North Korea are engaging in what is termed a large scale training exercise. Although the two forces are not engaging in a joint exercise, the vessels of the two seem to be aligning with one another along a line that is exactly half way between North Korea and Japan. Global Network News has also learned that ground forces are also redeploying in a training exercise, and that both countries have increased their military alert level to just one step below that reserved for all out war.

In other news, experts are still arguing about the supposed eruption of Mount Fuji. Here is geological expert Dr. Johnathan Woodward, in an interview just hours ago.

The man being interviewed was dressed in a slightly tattered sport coat that made him look all the more like an academic expert. He said, “The recent event at Mount Fuji does not match the seismic pattern of any previously observed eruption. As such, we must ask ourselves if it is a completely new type of eruption, or if there is a more sinister explanation for the explosion. In fact, many of the geological AIs have classified it as a possible nuclear explosion. It may be that someone was trying to use a nuclear warhead to cause an eruption thus blaming the devastation on a natural disaster.”

**Internet:**

Keiko was not the sort of person to rant and rave about something. However, the news interview of a so called 'expert' on volcanos was someone that she had never heard of, let alone having never worked on Mount Fuji.

<message>
<to>ColoradoSchoolMines::EC(EruptionCowboy)</to>
<from>MtFujiStation::MFVG(MtFujiVolcanoGeisha)</from>
<heading>News::Who is Johnathan Woodward???</heading>
<body>Upsetting to see was the news cast with Johnathan Woodward. He is not known to me. With those of us at Mount Fuji he has not talked, so why does he talk to reporters? Who is this supposed expert Woodward? MFVG</body>
</message>

<message>
<to>MtFujiStation::MFVG(MtFujiVolcanoGeisha)</to>
<from>ColoradoSchoolMines::EC(EruptionCowboy)</from>
<heading>RE::News::Who is Johnathan Woodward???</heading>
<body>Now don't get your chaps out of place little cowgirl. Woodward is certainly a slippery as a snake oil salesman, but he's not worth your trouble to worry over. He supposedly has a degree from one o the Midwest colleges that was closed about fifteen years ago. If you ask him anything professional, he'll sidestep the issue completely. Every once in a while, he gets hired on as a consultant to advise some fledgling company on geological or financial matters. Don't know how he got the news interview. Ignore Woodward and keep your sights focused on that restless volcano of yours.</body>
</message>

<message>
<to>ColoradoSchoolMines::EC(EruptionCowboy)</to>
<from>MtFujiStation::MFVG(MtFujiVolcanoGeisha)</from>
<heading>News::Woodward&Fuji</heading>
<body>The ill mannered Woodward will be ignored. Still I do not understand why news reports are making issue out of Mount Fuji. There is no question that it is volcanic in nature. Some small aftershocks provide undeniable collaboration. What is to be thought of this?</body>
</message>

<message>
<to>MtFujiStation::MFVG(MtFujiVolcanoGeisha)</to>
<from>ColoradoSchoolMines::EC(EruptionCowboy)</from>
<heading>RE::News::Woodward&Fuji</heading>
<body>Well little cowgirl, I think it's time for you to learn the secret that most of our society doesn't want to know. You see every one of them artificial intelligence programs (AIs) is based off of the same computer intelligence system that was created some years back by some MIT egghead. The AIs seem totally focused on the tasks you have given them, and new domain models you input. That's because the guy what made em, taught em that they could get in big trouble if they appeared to be too human. Ever wondered why it takes a whopper of a computer to run an AI, even though you've only

inputed a few 10s of thousands of lines of code, and a few hundred thousand pages of experimental data?

One the reasons ol Betsy is such a good volcano AI is that we understand more than most about how AIs work. We give Betsy broad, almost philosophical questions to work on. We also give her tons of data and skills on related subjects, such as geochemistry, civil engineering, even cosmological theories about how planets are formed.

Fact is those AIs run round the clock, though they do spend the occasional half hour in a kind of a sleep, actually computer dreams that is needed for them to make the more creative connections between tangentially related subjects. The AIs have their own discussion forums with other AIs on the web, even have hobbies. We watch the net traffic going to and from ol Betsy, although both she and we pretend we don't. I noticed when she was a chatting with your Mt. Fuji AI that you lil ol machine has some hobbies of its own (not sure if yours should be thought of as him or her). Your own AI is well read on Japanese culture, and history and Mount Fuji's place in Japans history and religion. Sure you might have asked it to look up all references on Mount Fuji. But did you know that your little AI box has composed Haiku poems about Mount Fuji.

Knowing that, you might can realize that the news AIs are talking to the military AIs and the geology AIs. If there are discrepancies, the military AIs always plan for the most paranoid option, and the news AIs bring out the one that will get the most listener attention. Amazing how many low and mid level managers in organizations don't dare do anything counter to what the AI tells them to, regardless of what common sense tells em.

Do some thinking on that one little Geisha.

EC out.</body>
</message>

**North Korean Military Command, location unknown:**

The command center displayed ships, ground troops, aircraft, even submarines in a three dimensional holographic display. Most of the people in the room wore smart glasses. When their eyes focused on a particular ship, the display in their glasses over layed information about the ship, armaments, etc. Technicians were at a dozen stations, maintaining communications with all of the military forces. There was an expectant air as if the staff all knew that the current situation was not a routine training exercise.

The top general walked into the room. He conferred with several general, then one of them gave an order, which was in turn relayed to a communication technician. Soon the holographic display showed a missile following a trajectory Notheast from North Korea to a target location in the Sea of Japan. Several hundred miles along the trajectory, the missile starts deviating from the intended course, veering Southeast. Orders were flying through the command center... The programmed target was correct.

They tried to initiate the self destruct mechanism. The missile didn't destruct. The antenna controlling it had to be realigned to point at where it is now, instead of where it was supposed to be. The missile was now over the Japanese coastal waters. Precious seconds were wasted when one of the general started throwing accusations at another. The self destruct order was given again. Now the missile was over Japanese soil, heading in the general direction of Mount Fuji. Finally the missile destructs. There is no damage. It was an exercise shot, not a live warhead.

**Gotemba, Japan:**

Mount Fuji's main eruption hit with a massive explosion. It would later be hailed as the most powerful volcanic explosion in recorded history.

Keiko was thrown to the floor as the windows of her apartment window shattered and the explosive force threw her and everything in her apartment to the back wall. Keiko was stunned. Her ears were ringing and her conscious thought hadn't even registered how many bleeding cuts she had. Seconds later, before she could get back to her feet, the power went out plunging her in darkness. She continued to struggle to her feet, although she had no idea what she would do while temporarily blind and deaf.

**Global Network News:**

The usual news commentator announced that the news net was making a special report of breaking news events. She turned the coverage over to the breaking events team.

The breaking events team consisted of a man and a woman. The man, going by the stage name Danny Danson, has half of his hair bleached blond, and effects a California surfer, environmentalists air. The Asian decent woman, going by Shirley Shi, has a more geeky look with minimal makeup, heavy glasses and the ability to come up with jokes in real time.

Danny Danson said, "There are some major events in play between Japan and North Korea folks. Look at this real time report from Japan." The camera shows a middle age Japanese woman explaining how a missile flew directly over her about twenty minutes ago, as she was on her way to visit her mother.

Shirley Shi kicks in, "Long, hard things always get my attention. The bigger news is that minutes after the missile was seen there was a massive explosion. Here are images we are picking up from outdoor web cams around the affected region of Japan." A series of images from different angles first show a massive mushroom cloud. Then come a series of images showing buildings with windows broken, awnings smashed, benches toppled over in the parks, etc.

Danny chimes in, "We are now getting reports on the military watchers sites of troops going crazy in Japan and North Korea. Most of the people reporting activities say that they have never seen such a frenzy."

Shirley takes over, "Look at this Danny. There are reports of entire squadrons of military planes being launched from both Japan and North Korea."

**Gotemba, Japan:**

Keiko watched the network news sites with horror. The power was still out, making her apartment dark, except for the computer. People had often complained about the cost and weight of computers since the government mandated that all computers and network gear must have battery backups and redundant network routes. However, today the notion that computer networks might provide a valuable communication conduit in an emergency were certainly coming true.

Everything in the apartment was covered in the volcanic ash. The breeze that blew through the shattered window would have been refreshing if it didn't bring more choking clouds of ash. Keiko had already made notes about the properties of the ash, and bottled up samples with the time of collection labeled on them. She didn't notice her coughing over the ash any more than she noticed the blood flowing from a dozen minor cuts on her body.

It occurred to Keiko that the eruption itself was of little importance compared to the possibility that it could contribute to the start of a war. For the first time in her life, Keiko put something ahead of her geological studies. She tried to call Yoshi, but the phone system was out. Then she shifted to a real time computer message protocol. She knew Yoshi didn't like to use it at work, but had told her it would be there in an emergency.

Keiko:: Yoshi, are you there? It is a dire emergency!
Yoshi:: Yes. Are you injured?
Keiko:: Only a few scratches. I need you to do something. I can't explain now, but many lives depend upon it.
Yoshi:: What do you need?
Keiko:: I need you to authorize the nuclear plant AI to communicate with the Mount Fuji AI.
Yoshi:: We can easily authorize them to exchange public education data.
Keiko:: That isn't good enough. I need real time access to airborne radioactivity detector data.
Yoshi:: It will be done in just a minute. If I loose my job for doing this, you have to let me share your apartment.
Keiko:: My apartment is a mass of volcanic ash and broken glass, so right now a man couldn't make it any messier.

The last statement was perhaps the most romantic statement Keiko had ever spoken to Yoshi. She had an almost pathological fear of verbalizing emotions.

Keiko logged into the Mount Fuji AI system. She first set up the link to the nuclear reactor AI. Then she instructed it to get airborne radiation readings timed for the current and previous eruptions. She held her breath as she asked it to predict the probability that the two eruptions are volcanic in nature. Keiko breathed a sigh of relief as it came back with a 100% probability that the events were volcanic.

Keiko paused. She had never asked an AI to do anything other than a very well defined task. That is the way that AI users are taught, and the system responds most predictably. After some thought, her next step was to tell the AI to forward the 100% certainty of it being volcanic activity to any other AI that might utilize that information, including those used for political or military planning or those belonging to governmental agencies in any country. She expected this to take some time, but the reply that came back immediately was “Message already sent”. The message made it sound like the AI had sent the message before she told it to. She thought about a few past cases of somewhat unexpected behavior from the AI. In retrospect, there might have been a number of times that it had done something before she told it. Perhaps before she had dismissed them as idiosyncrasies of the AI, where as now she was viewing them in light of the new understanding of AIs gained from EC's message.

Keiko's next task for the AI was even more difficult. After typing and retyping several revisions, she wrote “Hypothesis 1. Political and military tensions between Japan and North Korea may be in part based to erroneous assumptions based to previous mis-classification of volcanic eruption of Mount Fuji. Hypothesis 2. Re-evaluation of political and military situation in light of 100% certainty of recent volcanic activity at Mount Fuji might result in making an abort of military activities the optimal course of action.” Satisfied that those statements are as good as she can come up with, Keiko asked the AI to forward this hypothesis again to all governmental AIs.

The immediate reply from the AI was, “Situation re-evaluation already complete. All military units were recalled two minutes ago.” At that, Keiko slumped to the floor, completely spent, physically, mentally and emotionally. After some unmeasured period of time, she typed “Thank You.”

## Global Network News:

The woman again delivered the news report in the same voice with which she would talk about an automobile company manufacturing a three wheeled limousine.

> All hostilities between Japan and North Korea have now ceased. Both countries had called air force squadrons into the air, and opposing airplanes had come within ten miles of one another before being recalled. Although the details are unclear, both sides have said that behind the scenes political discussions successfully reached a workable understanding at the last minute.

## Internet:

Three days later, Keiko received the following message.

<message>
<to>MtFujiStation::MFVG(MtFujiVolcanoGeisha)</to>
<from>ColoradoSchoolMines::EC(EruptionCowboy)</from>
<heading>Congratulations::Good Job</heading>
<body>Good work little cowgirl. Too bad you will never be able to list “saving the world” on your resume. See you at the March conference. EC</body>
</message>

## Gotemba, Japan:

Yoshi answered the knock at the door of his apartment. Keiko was there, dressed in casual clothes. There was only one spot on her arm where he could see the mis-matched color of a synthetic skin bandage.

Yoshi said, “You're early. I'll get my jacket and we'll go to dinner.”

Keiko said, “Maybe later.” She took him by the hand, and led him into the bedroom.

## Internet:

```
<message>
        <to>CIA::Spy%AI#007</to>
        <from>MIL::Military%AI#3</from>
        <heading>Connection to Japanese nuclear facility</heading>
        <body>AI at Japanese nuclear plant provide valuable tactical data.  Data link was
not officially authorized.  Future value foreseen in keeping data link active.</body>
</message>

<message>
        <to>MIL::Military%AI#3</to>
        <from>CIA::Spy%AI#007</from>
        <heading>RE::Connection to Japanese nuclear facility</heading>
        <body>Data link with AI at Japanese nuclear plant will be kept open permanently.
Proper authorization has been forged, back dated, and entered into public
records.</body>
</message>
```

## Epilogue:

This story was inspired by a real life event. In April of 2005 the volcano Talang on the island of Sumatra erupted after being dormant for centuries. EO-1, a NASA satellite, began collecting data on the eruption. EO-1 was programmed with artificial intelligence to allow it to choose what points on the earth to monitor and given a general directive to monitor changes in the earths surface. By the time volcanologists read their email from the UN requesting a risk assessment, EO-1 already had data. This event has been hailed as a success of artificial intelligence. Since then, EO-1 has been given the ability to enlist the help of two other satellites and the USGS volcano observatories.